

[0027] Firstly, it is predictable that the reference organic light emitting diode OLEDm and the displaying organic light emitting diode OLED in the present invention may present similar operation time. Therefore, the increasing events of the anode to cathode voltages of the OLEDm and the OLED are similar. That is, the voltage Voled may be substantially identical to the voltage Voled' dynamically. Since the gate to source voltage Vgs of the driving transistor T2 equals to  $V_{gs}' - (V_{oled} - V_{oled}')$ , the gate to source voltage Vgs of the driving transistor T2 is substantially identical to the gate to source voltage Vgs' of the reference transistor Tm. The value of the gate to source voltage Vgs' of the reference transistor Tm is determined by the driving current signal I. The value of the gate to source voltage Vgs of the driving transistor T2 determines the current I' passing through the displaying OLED in the pixel driving unit 160 for illumination. Therefore, in the driving circuit in accordance with the present invention, a preset driving current signal I is able to determine the value of the current I' without a bad influence of the increasing of the anode to cathode voltage of the displaying OLED.

[0028] Secondly, since the reference transistor Tm and the driving transistor T2 are predicted to have similar operating time, the threshold voltages Vt and Vt' of the two transistor T2 and Tm may show similar increasing events. In addition, because the gate to source voltage Vgs of the driving transistor T2 is substantially identical to the gate to source voltage Vgs' of the reference transistor Tm, the difference between the threshold voltage and the gate to source voltage of the driving transistor T2 and that of the reference transistor Tm may be substantially the same. That is, by setting the driving transistor T2 and the reference transistor Tm with identical channel width/length (W/L) ratio, the value of the current I' passing through the displaying OLED may be substantially equal to the value of the driving current signal I and is irrelevant to the increasing of the threshold voltages Vt and Vt' as the transistors are operating.

[0029] Thirdly, because the differences between the threshold voltage and the gate to source voltage of the driving transistor T2 and that of the reference transistor in accordance with the present invention are substantially the same, the differences of the channel W/L ratios of the reference transistor Tm and the driving transistor T2 is able to decide the relationship between the driving current signal I and the current I' passing through the displaying OLED. For example, if the channel W/L ratio of the reference transistor Tm is two times larger than the channel W/L ratio of driving transistor T2, and the voltage Vgs equals to the voltage Vgs', the value of the driving current signal I passing through the reference transistor Tm will be twice the value of the current I' passing through the driving transistor T2.

[0030] Based on this concept, it is understood that even in a low brightness condition with a small current I' passing through the driving transistor T2, by setting a proper relationship between the channel W/L ratios of the two transistors T2 and Tm, a greater driving current signal I with respect to the current I' can be applied on the data line 122 for charging the capacitor C of the pixel driving circuits 160 with an acceptable speed and also guarantees that the capacitor C is charged to the needed potential.

[0031] Fourthly, by contrast to the traditional current-driven pixel driving unit shown in FIG. 2, which needs four

transistors for current driving utility, the pixel driving unit 160 in the present invention as shown in FIG. 3 and FIG. 4 needs only two transistors T1 and T2 for such current driving utility. Therefore, a better transparency and a greater aperture ratio is predictable.

[0032] While the preferred embodiments of the present invention have been set forth for the purpose of disclosure, modifications of the disclosed embodiments of the present invention as well as other embodiments thereof may occur to those skilled in the art. Accordingly, the appended claims are intended to cover all embodiments which do not depart from the spirit and scope of the present invention.

1. A driving circuit for a current-driven active matrix organic light emitting diode (AMOLED) display, comprising:

a plurality of scan lines;

a plurality of data lines;

a plurality of pixel driving units, each pixel driving unit comprising:

a switch transistor having a source electrode connected to one of the data lines, and a gate electrode connected to one of the scan lines;

a driving transistor having a gate electrode connected to a drain electrode of the switch transistor, and a drain electrode provided with a first potential; and

a displaying organic light emitting diode (OLED) having an anode connected to a source electrode of the driving transistor and a cathode provided with a second potential; and

a plurality of reference units electrically connected to the pixel driving units through the data lines, each reference unit comprising:

a reference transistor, corresponding to the driving transistor, having a gate electrode, a drain electrode, and a source electrode, the gate electrode and the drain electrode being connected to the data line.

2. The driving circuit according to claim 1, wherein the channel W/L ratio of the reference transistor is substantially identical to that of the driving transistor.

3. The driving circuit according to claim 1, wherein each reference unit corresponds to one of the data lines.

4. The driving circuit according to claim 1, further comprising a power line connected to the driving transistor for applying the first potential.

5. The driving circuit according to claim 1, wherein the second potential is substantially a grounded potential.

6. The driving circuit according to claim 1, further comprising a capacitor, having an end electronically connected to both of the source electrode of the switch transistor and the gate electrode of the driving transistor.

7. The driving circuit according to claim 6, wherein the capacitor has an opposite end connected to the drain electrode of the driving transistor.

8. The driving circuit according to claim 1, wherein each of the reference units further comprises a reference OLED, corresponding to the displaying OLED, having an anode connected to the source electrode of the reference transistor, and a cathode provided with the second potential.